

REMARKS

The Examiner has advised that a number of references listed in the specification have not been considered on the record. Therefore, Applicant is submitting herewith a supplemental Information Disclosure Statement in order to place these and other additional references on the official record of examination. Applicant's attorney has noticed that U.S. Patent No. 4,830,798 issued to Maeda, discussed by the examiner in the present Office Action, is not present in Applicant's prior Information Disclosure Statement, nor is at present in the Examiner's Notice of References Cited (form PTO-892). Therefore, this reference is being listed in the present supplemental Information Disclosure Statement.

The Examiner has objected to the use of reference numeral (10) in Claim 1 because it is not mentioned in the specification or drawing. Applicant has amended the specification to include reference numeral (10) for the element "synthetic turf pile carpet," as this numeral is shown to refer to this element in FIG 1. Thus, no new matter is being added through this amendment.

The Examiner has stated that the specification fails to provide support for the embodiments recited in claims 3-6. Applicant wishes to direct the Examiner's attention to the specification at page 6, lines 13-18, where it is disclosed that the raw polypropylene material used in the present invention is available at densities of 1.3, 1.9 and 2.8 lbs. per cubic foot, and that it is known to those skilled in the art that the specific density selected may be varied for specific sport activities. It is respectfully submitted that claim language which recites density ranges for the polypropylene material which include these stated amounts as the density range end points should be considered supported by this portion of the specification. In addition, this specification states at page 4, lines 4-6 that the thickness of the pad, depending upon the particular results desired, may also be varied from about 1/4 inch thickness to as much as up to 12 inches thick. Examples within this range are provided within the specification at page 6, lines 1-2 (an underpad of 1/2 inch to 2 inches in thickness) and at

page 6, lines 5-6 (with an underpad of at least about one inch thick). Therefore, it is also respectfully submitted that the specification supports the claimed ranges in this regard.

Claim 1 is objected to under 35 U.S.C. 112 as being indefinite for the use of the terms "grass-type" and "blade-like." Claims 9 and 10 stand similarly rejected for the use of the terms "sand-alike" and "adhesive-like," respectively. Applicant has amended these claims for clarity, using replacement terms found in the specification.

Claims 1 and 9 are objected to under 35 U.S.C. 112 as being indefinite for the use of the terms "closely," "densely," "firm," "relatively thick" and "fine." Applicant has deleted the term "relatively thick" from Claim 1, as it is not necessary in order to define the invention. Applicant respectfully submits that the remaining terms are not indefinite because one of ordinary skill in the art would be reasonably apprised of the scope of the invention by knowing the typical strand or blade spacing, the typical dense packing of strands or blades and the typical fine nature of the individual strands that are inherent to a typical natural grass surface.

Claims 1 and 10 are objected to under 35 U.S.C. 112 as being indefinite for the use of the term "such as." Applicant has amended Claim 1 to delete the end portion of this claim, since it appears to be somewhat redundant. The end portion of this claim now recites that the carpet and its supporting underpad closely simulate a portion of a natural grass surface. Applicant has also amended the end portion of claim 10 to delete the objected-to language.

Claims 1 and 8 are objected to under 35 U.S.C. 112 as being indefinite for the use of the phrases "and similar ... playing surfaces" and "or the like." As set forth above, Applicant has amended Claim 1 to delete the end portion of this claim, since it appears to be somewhat redundant. Applicant has also amended Claim 8 to delete the objected-to language.

Claim 6 is objected to under 35 U.S.C. 112 as being indefinite for the use of the phrase "in the range of approximately 1.9 pounds per cubic foot." Applicant has amended this claim to remove the objected-to language.

Claims 3-6 are objected to under 35 U.S.C. 112 as being indefinite because it is

unclear if the recited densities describe the polypropylene bead material before molding into a sheet or the molded underpad made from polypropylene beads. Additionally, the Examiner states that it is unclear in Claims 3 and 4 if the thickness describes the underpad or the beads. Applicant has amended these claims for clarity, and has also amended Claims 1 and 2 in this regard for clarity.

Claims 1 and 10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,505,960 issued to Leffingwell in view of U.S. Patent No. 4,830,798 issued to Maeda. Applicant respectfully submits that the combination of the Leffingwell and Maeda references still does not yield the present invention as set forth in Claims 1 and 10. Specifically, the subject matter of Claims 1 and 10 differs from the disclosures of the Leffingwell and Maeda references in that neither reference teaches the combination of a polypropylene material in bead form in combination with an artificial carpet as a game playing field. The use of polypropylene material in bead form for the underpad improves the feeling of playing on natural grass, in a way not contemplated by the cited references.

Although the Leffingwell reference describes the need for improvements in shock absorbance for artificial turf systems, this reference addresses this need by providing a layered pad solution, wherein each layer exhibits different compression properties. This reference also sets forth a number of specific selections for pad materials, none of which include polypropylene. The Leffingwell reference does not, however, contemplate a single pad material which has the desirable shock-absorbing characteristics in a single layer. The pad construction described in the Leffingwell system is likely to be more expensive and less convenient to produce than the pad component of the present invention. Each of the material and property selections for the Leffingwell reference was made as part of a combination of layers that would produce a synthetic turf that resembled natural turf as closely as was possible for that individual set of materials. The present invention, on the other hand, is a turf made from its own material selection, discovered as part of the present invention, which

produces an advanced synthetic turf that even more closely resembles natural turf. Since this separate material selection is unique to this invention, the material used in this context should be patentable. Therefore, it is respectfully submitted that Claims 1 and 10 should be allowable without amendment.

Although the Maeda reference discloses that polypropylene bead materials are known, there is no teaching in this reference for using polypropylene bead material in combination with an artificial grass carpet as a game playing field. This reference, on the other hand, is concerned with presenting a method for production of a foamed article of a polypropylene resin which improves dimensional accuracy, fusion rate and surface characteristics (col. 1, lines 65-68). The primary focus of the Maeda reference involves production method steps including controlling the degree of the peak fusion heat and controlling the compressive rate of pre-expanded beads to a specific range (col. 2, lines 4-15), to achieve these specific ends, which are different from those contemplated in the present invention. It is submitted that the statement from the Maeda reference that foamed articles of polypropylene have excellent compressive strength, heat resistance and strain recovery after compression, and as such, have been used as shock absorbing packaging materials, falls far short of the discovery that an underpad formed of a sheet of a molded, open cell, expanded, resilient polypropylene material in combination with a synthetic grass carpet produces an effect which very closely simulates a natural grass surface.

For the above reasons, it is respectfully requested that the rejection based on the Leffingwell and Maeda references be withdrawn.

Claims 2-8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the cited Leffingwell and Maeda patents, as applied to Claim 1 above, and further in view of U.S. Patent No. 4,931,477 issued to Shiiki et al and U.S. Patent No. 5,035,275 issued to Yamaguchi. Applicant respectfully submits that the further combination of the Shiiki et al and Yamaguchi references still does not yield the present invention as set forth in Claims 2-8. Specifically, the

range of underpad thicknesses set forth in the Leffingwell reference (from about 6-50 mm, or about 0.23 to about 2 inches) does not contemplate a suitable thickness range of up to 12 inches, as set forth in Claim 2. In addition, pad thicknesses are contemplated by the Leffingwell reference only in the context of the much more complicated, and expensive, manipulation of pad thicknesses in a two-layer pad combination, to achieve the desired properties.

It is respectfully submitted that the Shiiki et al reference also fails to suggest that an underpad formed of a sheet of a molded, open cell, expanded, resilient polypropylene material in combination with a synthetic grass carpet produces an effect which very closely simulates a natural grass surface. This reference primarily concerns a method for shrinking polypropylene resin pre-expanded beads to reduce storage and transportation costs until the beads are re-expanded to their bulk density before shrinkage by impregnating the interior of each bead with air or inorganic gas (col. 2, lines 5-37). The Yamaguchi reference also fails to suggest that an underpad formed of a sheet of a molded, open cell, expanded, resilient polypropylene material in combination with a synthetic grass carpet produces an effect which very closely simulates a natural grass surface. This reference primarily concerns a method for controlling the pyrolysis rate and thermal shrinkage of a plastic foam molding, and a process for producing a solid metal casting which comprises embedding a plastic foam molding in a support material, contacting the plastic foam molding with molten metal, and cooling the molten metal below the melting temperature of the metal (col. 1, lines 50-64). For these reasons, it is respectfully submitted that the additional combination of these two references still does not yield the combination claimed in the present Claims 2-8, and it is respectfully requested that the rejection based on these additional references also be withdrawn.

Claim 9 stands rejected under 35 U.S.C. 103(a) as being unpatentable over the cited Leffingwell and Maeda patents, as applied to Claim 1 above, and further in view of U.S. Patent No. 5,373,667 to Lemieux (the present Applicant's prior patent). While Applicant's prior patent

disclosed a method of treating a grass-like blades surface of a synthetic turf including a sandblasting step, that patent also did not contemplate that an underpad formed of a sheet of a molded, open cell, expanded, resilient polypropylene material in combination with a synthetic grass carpet produces an effect which very closely simulates a natural grass surface. For this reason, it is respectfully submitted that the additional combination of Applicant's prior patent still does not yield the combination claimed in the present Claim 9, and it is respectfully requested that the rejection based on this additional reference also be withdrawn.

Claim 11 stands rejected under 35 U.S.C. 103(a) as being unpatentable over the cited Leffingwell and Maeda patents, as applied to Claim 1 above, and further in view of U.S. Patent No. 5,820,475 to Luna. As the Luna reference is primarily directed to a compact golf ball teeing machine, which does not disclose information about specific properties of a synthetic grass surface, it is respectfully submitted that the further combination of this reference with the previous references cited still does not yield the combination set forth in the present Claim 11. For this reason, it is respectfully requested that the rejection based on this additional reference also be withdrawn.

Applicant is adding new claims 12-22 to this application. The specification sets forth at page 7, lines 9-10, that the turf may also be useful upon a rooftop or patio or deck surface where the turf will provide an insulated, waterproof covering. New claims 12-22 therefore correspond to existing claims 1-10, as amended herein, with the substituted purpose "synthetic rooftop or patio or deck surface" in place of "synthetic turf surface for golf and other grass-type game playing surfaces." In addition, the end portion of new claim 12 recites that the "carpet and its supporting underpad closely resemble a portion of a natural grass surface" and the end portion of new claim 14 recites that the "surface resembles a simulated natural grass surface." Several locations in the specification discuss that this material is intended to resemble a natural grass surface, including page 1, line 15, page 2, lines 6-7, lines 10-13 and lines 16-17, and p. 7, lines 5-9. Therefore, it is submitted that, since these

claims are very similar to the existing claims in the application, as modified only to reflect the use of the material as a rooftop or patio or deck surface material that resembles a natural grass surface, and since explicit support has been noted in the specification for this claim language, adding these new claims into this application should be acceptable, and should not be considered as new matter.

Should the Examiner have any questions, or wish to discuss this application further, she is invited to contact the undersigned attorney directly at (248) 641-1600 prior to issuing another Office Action so that any remaining issues can be worked out quickly and conveniently.

Respectfully submitted,

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By: Garrett C. Donley
Garrett C. Donley
Reg. No. 34,579
Attorney for Applicant

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, MI 48303
(248) 641-1600
GCD/sed

ATTACHMENT 1 - SPECIFICATION CHANGES (MARKED VERSION)

The paragraph beginning at page 3, line 22 is amended as follows:

FIG. 1 schematically illustrates a fragment of a synthetic turf pile carpet 10. The carpet has numerous, closely spaced, tufts 11 which are formed of U-shaped, flat, narrow bent strips or strands 12 that form artificial grass blades. The turfs are fastened upon a base or backing sheet 14. This sheet may be made of a woven cloth or the like fabric material formed of stable, weather resistant, plastic such as polypropylene or nylon fibers or the like. The specific cloth must be flexible but, otherwise, may vary as to its composition.

ATTACHMENT 2 - CLAIM CHANGES (MARKED VERSION)

1. (Once Amended) A synthetic turf surface for simulating golf and other [grass-type] natural grass game playing surfaces formed of a synthetic grass carpet having a flexible base sheet with closely spaced apart, upright [blade-like] strands of plastic material intended to form artificial grass blades secured to the sheet, and with the strands forming a densely packed, exposed upper surface and said base sheet being positioned upon a resilient cushion underpad arranged upon a firm support surface, the improvement comprising:

said underpad being formed of a [relatively thick] sheet of a molded, open cell, expanded, resilient polypropylene [bead] material;

whereas said carpet and its supporting underpad closely simulate a portion of a natural grass [golf course] surface[, such as a green or tee-off or fairway portion and similar grass-type playing surfaces].

2. (Once Amended) A synthetic turf surface as defined in claim 1 [and], said polypropylene material being formed from polypropylene beads being of density of between about 1.3 to 2.8 pounds per cubic foot and said underpad being of a thickness of between about 1/4 inch to 12 inches.

3. (Once Amended) A synthetic turf surface as defined in claim 2 [and], said polypropylene material being [of] formed from polypropylene beads having a density of approximately between about 1.3 and 1.9 pounds per cubic foot and said polypropylene material having a thickness of approximately between about 1 inch to 2 inches whereby the surface forms a simulated natural golf green or a tee-off portion of a golf course.

4. (Once Amended) A synthetic turf surface as defined in claim 2 [and with the density of], said polypropylene material being formed from polypropylene beads having a density of approximately 1.9 pounds per cubic foot and said polypropylene material having [of] a thickness of approximately between about 1/2 inch to 1 inch thickness to form a simulated natural grass tennis court playing surface.

5. (Once Amended) A synthetic turf surface as defined in claim 2 [and with the density of], said polypropylene material being formed from polypropylene beads having a density of approximately 1.3 pounds per cubic foot and said underpad being approximately between about 1 to 2 inches thick to form a simulated natural golf surface tee-off portion.

6. (Once Amended) A synthetic turf surface as defined in claim 2 [and with the density of], said polypropylene material being [in the range of] formed from polypropylene beads having a density of approximately 1.9 pounds per cubic foot and the thickness of the underpad being approximately between about 1 to 2 inches, to form a simulated natural golf green surface.

8. (Once Amended) A synthetic turf surface as defined in claim 7 and with the density of said molded underpad being approximately 2.36 pounds per cubic foot to form a simulated natural [golf green or the like] portion of a golf course surface.

9. (Once Amended) A synthetic turf surface as defined in claim 1 and including the upper end portions of said strands being shredded into fine silvers which are densely matted and intertwined, and with a layer of [sand-like] sand or similar particulate material applied upon the upper surface of the base sheet and generally beneath the intertwined

slivers and substantially filling the interstices between the strands and said layer is covered by said intertwined slivers.

10. (Once Amended) A synthetic turf surface as defined in claim 1 and including [an adhesive-like] a reinforcement binder layer of a flexible, resilient material, applied to the lower surface of the base sheet and above the upper surface of the underpad and formed of a synthetic plastic adhesive material [such as a polyurethane plastic].